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Type-D personality, psychosomatic symptoms and voice handicap in female voice patients: A perspective on vocal communication

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Abstract

Objectives: The association between vocal communication and personality was studied in 82 female voice patients with a mean age of the 39.3 years (range 18–65 years). *Study design:* The relation between type-D personality (Type-D Scale-16), psychosomatic symptoms (Symptom Check List–90) and the biopshychosocial impact of the voice problem (Voice Handicap Index) was assessed. *Results:* The findings indicate that type-D voice patients are relatively more handicapped by their voice problem, predominantly in the emotional domain, and have a relatively higher level of psychosomatic symptoms compared to non-type-D patients. *Conclusions:* Apparently, the well-being of females with a voice problem is more at risk in type-D than in non-type-D personalities. These results lead to the suspicion that voice patients with a type-D personality are especially at risk because they are prone to be involved in a circular negatively reinforcing process. This process influences the vocal problem in such a way that a detrimental course of vocal communication possibly occurs.

Key words: *DS 16, VHI, SCL-90, well-being, emotion, vulnerability, disposition, trait, state*

Introduction

Voice problems often have a multifactorial genesis and the vulnerability of voice problems depends on various factors, such as personality, physical and mental condition, and imbalance between vocal load and capacity. Furthermore, voice problems may have a biopsychosocial impact on vocal communication and therefore on quality of life (1–15). The negative impact is expressed in various ways, such as effort (bio), feeling ashamed (psycho), and avoiding conversations (social).

Stress influences voice and vice versa. A model of stress applied to the use of the voice in communication (stress-voicing) is described by Van Opstal (11,12) and Wellens and Van Opstal (10). The central feature in this model is emotion, which has three observable response systems: autonomic neural reactions, verbal-cognitive behaviours and motor acts (17). Emotion in vocal communication is considered to affect the vocal instrument. Therefore, how the person perceives a voice problem and reacts to it emotionally is supposed to be an important determinant for the impact of the voice problem on the biopsychosocial functioning of the person (1).

Personality has been linked to voice disorders (13,18). Personality is one of the determinants of emotion and, consequently, influences voice problems and vocal communication (10). A type-D personality can be considered as a continuous high stress level (trait) that influences reaction to disease (18). The traits of type-D personality predispose to a continuous high stress level that influences reaction to disease (18).

In a study of female student teachers and teachers of primary education, Thomas et al. found that type-D student teachers did not report voice complaints more frequently than the non-type-D students, but did have higher Voice Handicap Index (VHI) scores (14). Additionally, significantly more subjects with a type-D personality showed a VHI score higher than the 75th percentile compared to subjects with non-type-D personality and they sought less (para)

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medical help. This indicates that individuals with a type-D personality appraise their voice problems in a different way and react differently to their voice problems than non-type-D individuals. In the study of Thomas et al., the VHI subscales were not addressed (14). Meulenbroek et al. showed that the relatively large biopsychosocial impact of the voice (in particular the emotional impact) is related to the presence of a type-D personality, a higher level of psychosomatic symptoms and passive coping (15). This study was also performed with female student teachers.

The aim of this study was to assess the association between type-D personality, psychosomatic symptoms and a differentiated voice handicap in female voice patients. The hypothesis is that female voice patients with a type-D personality report a relatively higher level of psychosomatic symptoms compared to voice patients without a type-D personality and that they report a relatively stronger biopsychosocial impact of their voice problem (voice handicap).

Method

Subjects

This study was part of a project on the causes and consequences of voice problems in outpatient-care voice patients. Female patients who presented at the outpatient clinic for the treatment of voice complaints, were included in the study. Of the 232 patients who were asked to answer the questionnaires, 103 returned the questionnaires, leading to a response rate of 44%. Of the returned questionnaires, 17 could not be included in the study due to incomplete patient details. Four patients did not complete the questionnaire completely. Finally, the data of 82 patients were analysed. The mean age of the 82 patients was 39.3 years (range 18–65 years).

After assessment of the voice problem, history and physical examination, the patients were asked to sign an informed consent form, to complete various questionnaires and to send the questionnaires back to the clinic in a prepaid envelope.

Instruments

Personality type-D was assessed using the Type-D Scale-16 questionnaire, which consists of an eight-item negative affectivity and an eight-item social inhibition scale (16). The items were rated on a 5-point scale as follows: false (0), rather false (1), neutral (2), rather true (3), true (4). Based on the questionnaire, a type-D classification was made (16). Subjects who scored high on both negative affectivity and social inhibition, as determined by the median split, were classified as type-D. The group consisted of 74.4 % ($n = 61$) non-type-D and 25.6% ($n = 21$) type-D patients.

The Dutch version of the Voice Handicap Index (VHI) questionnaire was used to assess the biopsychosocial impact of the voice problems (19,20). The VHI questionnaire consists of 30 items, comprising three subscales of 10 items: emotional (VHI-E), physical (VHI-P) and functional (VHI-F) subscales. The items were rated on a 5-point scale as follows: never (0), almost never (1), sometimes (2), almost always (3), and always (4). The total score (VHI total) ranges from 0 to 120 and each subscale score from 0 to 40.

The Dutch version of the Symptom Check List-90 (SCL-90) (21,22) was used to assess psychosomatic symptoms within nine different domains: general anxiety (ANG, 10 items), agoraphobic anxiety (AGO, seven items), depression (DEP, 16 items), somatic complaints (SOM, 12 items), insufficiency in thinking and acting (IN, nine items), interpersonal sensitivity and mistrust (SEN, 18 items), hostility (HOS, six items) and sleeping disorders (SLE, three items). The remaining nine items do not belong to one of these subscales and are therefore collectively termed 'miscellaneous items' (MISC). The items were rated on a 5-point scale: not at all (0), a little bit (1), moderately (2), quite a bit (3) and extremely (4).

Statistical analysis

The data were analysed using SPSS 16.0. One-sample, two-tailed Kolmogorov-Smirnov tests were applied in order to determine if continuous outcome variables were normally distributed. Student's *t*-test was applied for assessment of the difference between normally distributed continuous outcome variables and the Mann-Whitney *U*-test was used for non-normally distributed variables. The correlations between non-normally distributed continuous outcome variables were expressed by Spearman's rho. The significance level was set at $p < 0.05$.

Results

Both type-D and non-type-D personality patients had a relatively high score on the VHI physical subscale (VHI-P) (Table I) compared to the VHI functional (VHI-F) and the VHI emotional subscale (VHI-E). The type-D and non-type-D personality patients did not show significantly different scores on the VHI total scale and VHI functional (VHI-F) and VHI physical (VHI-P) subscales. However, on the VHI emotional subscale (VHI-E), type-D patients

Table I. The mean scores (standard deviation) of the VHI Total (VHI-TOT) and VHI Functional (VHI- F), VHI Emotional (VHI- E) and VHI Physical (VHI-P) subscales of the type-D and non-type-D patients. $n = 82$.

	VHI-F	VHI-E	VHI-P	VHI-TOT
Non-type-D	9.2 (6.25)	9.1 (7.66)	18.7 (7.30)	37.0 (18.25)
Type-D	12.1 (7.36)	13.9 (12.00)	19.0 (8.17)	45.1 (20.95)
p	0.081	0.018	0.842	0.094

showed a higher score than non-type-D patients (Table I).

Type-D patients showed significantly higher SCL-90 total and subscales scores compared to the non-type-D patients (Table II).

To assess if more patients with a type-D personality have a combination of both high voice handicap and a higher level of psychosomatic symptoms than their non-type-D counterparts, the group was subdivided. A 'group-high' consisted of individuals who had a higher score than the median on both the VHI total and the SCL-90 total score and a 'group- low' consisted of individuals who had an equal or lower score than the median on the VHI total and/or the SCL-90 total score: 67.1% of the patients belonged to the group-low and 32.9% to the group-high. Of the type-D patients, 57.1% belonged to the group-high and 42.9% to the group-low. Of the non-type-D patients, 24.6% belonged to the group-high and 75.4% to the group-low. This difference was significant ($\chi^2 = 7.496$, $p = 0.006$). The odds ratio (OR = 4.1) indicated that type-D patients have a four-times greater risk of having a combination of both high voice handicap and more psychosomatic symptoms than non-type-D patients.

The results in Table III show that the VHI total and subscales scores are significantly positively correlated with the SCL-90 total score. The VHI-E score is strongly correlated with the SCL-90 total score compared to the VHI-F and VHI-P scores.

Discussion

In the course of assessing vocal communication in female voice patients with type-D personality versus those with non-type-D personality the scores of the differentiated Voice Handicap Index scale (VHI) and the Symptom Check List-90 (SCL-90) for psychosomatic symptoms were studied.

Denollet et al. described type-D personality as having traits of anxiety disposition and a stable tendency to inhibit the expression of emotions and behaviours in social interaction (16,23). Type-D personality has been shown to correspond with high anxiety, depression, sadness, anger and introversion, low self-expression, sub-assertiveness, withdrawal and social alienation and can be considered as a trait of continuously high stress level (16,24,25). Trait stress means proneness to an increased reactivity and consequently a faster and more intense reaction to stressors (11). An interesting finding of the present study is the high scores of type-D personalities on the total and subscales on the SCL-90 (except the SLE subscore). The SCL-90 assesses a broad scale of attitudes, physiological/neural-vegetative reactions, expressive and purposive behaviours, that are symptoms of psychosomatic illness. Type-D personalities' higher vulnerability to stressors in voice patients compared to non-type-D personalities is expressed by the scores on the SCL-90.

Subjects with the combination of a high VHI score and a high SCL-90 score represent a population that is relatively severely affected in terms of strong biopsychosocial impact and psychosomatic illness. Significantly more subjects with type-D personality belong to this group compared to subjects with non-type-D personality.

Another interesting finding is that voice patients with a type-D personality and patients with a non-type-D personality did not report differently on the perception of physical and functional stressors that are associated with disturbed voice (VHI-P and VHI-F). However, type-D patients had a higher score on the emotional subscale compared to non-type-D patients.

The VHI-E represents a singular aspect of emotion because it is focused on vocal communication only, while the SCL-90 is focused on more general aspects. The affective perception that is assessed by the VHI-E is limited to a negative mood, such as irritation, shame and helplessness. Fear and anticipatory

Table II. The median scores (inter-quartile range) of the SCL total (TOT) and subscores of the type-D and non-type-D patients. The significance level was calculated with the Mann-Whitney *U*-test. The SOM subscores were normally distributed and therefore represented by the mean (standard deviation). The significance level of the SOM subscores was calculated with Student's *t*-test. $n = 82$.

	ANX	AGO	DEP	SOM	IN	SEN	HOS	SLE	MISC	TOT
Non-type-D	11.00 (3.00)	7.00 (0.00)	18.00 (7.00)	16.3 (4.29)	11.00 (5.00)	20.00 (5.00)	6.00 (1.06)	4.00 (2.00)	10.00 (1.56)	102.00 (26.50)
Type-D	14.00 (5.00)	7.00 (3.91)	29.00 (10.50)	21.5 (4.75)	15.00 (9.50)	28.00 (10.49)	8.00 (3.50)	6.00 (4.00)	12.00 (3.50)	145.00 (59.00)
p	0.001	.003	< 0.001	< 0.001	< 0.001	< 0.001	0.002	0.100	< 0.001	< 0.001

Table III. Correlations between the voice handicap index and general psychosomatic symptoms. Spearman's correlation coefficient (level of significance). $n = 82$.

	SCL TOT
VHI F	0.325 (0.003)
VHI E	0.507< 0.001
VHI P	0.263 (0.017)
VHI TOT	0.448< 0.001

anxiety about non-effective vocal communication is not expressed in the VHI-E scale. Compared to the non-type-D patients, type-D patients showed a relatively stronger aversion when perceiving their disturbed voicing and the social stressors that are perceived in association with their disturbed voicing (Questions of the VHI-E subscale: "My voice problem upsets me"; "I am tense when talking with others because of my voice"; "I am ashamed of my voice problem"; "My voice makes me feel handicapped"; "My voice makes me feel incompetent"). In addition, the effect that the disturbed voice has on the social environment is appraised with relatively strong aversion ("I feel annoyed when people ask me to repeat"; "People seem irritated with my voice"; "I find other people do not understand my voice problem"; "I feel embarrassed when people ask me to repeat"; "I feel annoyed when people ask me to repeat"). A tendency to cope by avoidance is represented in only one item of the VHI-E scale ("I am less outgoing because of my voice"). The finding of the present study, that the appraisal of a voice problem is strongly defined by the person's personality (type-D) in female voice patients, is consistent with the studies of Thomas et al. (14) and Meulenbroek et al. (15), who assessed female (student) teachers.

This study has the advantage that patients presenting in the outpatient clinic were willing to report voice complaints. The results of this clinical population are less likely to be biased by the subject's social aspirations, as might be the case in a population of professional voice users or persons who are in an educational context that evaluates a person's job qualifications.

Furthermore, the results of this study confirm those of the study of Meulenbroek et al. indicating that the Voice Handicap Index is predominantly influenced by the voice users' emotional appraisal of disturbed vocal communication (15). This finding extends the results of the study of Thomas, who found a higher sensitivity of type-D students to their voice complaints, based on only VHI total (14).

Moreover, the study revealed a serious impact on well-being in vocal communication due to the combination of a perceived greater handicap of the voice problem and of a higher level of psychosomatic symptoms in type-D voice patients, compared to non-type-D patients. The combination of these high reactivity levels is an indication that type-D patients are probably more at risk of a worsening of their vocal problems than their non-type-D counterparts.

A question arises as to why subjects with a type-D personality are especially at risk. A chronic interaction between increased emotional reaction to affected vocal communication (VHI-E) and an increased level of psychosomatic symptoms (SCL-90) may become negatively reinforced by the 'mental distress traits' of anxious subjects, suffering from social inhibition (part of type-D), until the individual risks exceed a 'critical' threshold. At such a level of arousal/activation the person does not return spontaneously or easily to a moderate or rest level (11,12).

In the anxious (trait of type-D) person who is in a state of high level of psychosomatic symptoms (high SCL-90 total), the vocal problem that evokes aversive feelings of helplessness, shame, annoyance (high VHI-E), may become a critical source of continuous worrying that increases a risk of anticipatory anxiety (10,11,26). Type-D personalities show relatively high social inhibition with a tendency for avoidance. They show a stable tendency to suppress the expression of emotions and behaviour in society in order to avoid disapproval and reaction by others (25). If, in type-D patients, the anticipation of not responding properly by vocal communication chronically interacts with social inhibition, anticipatory anxiety may evoke non-effective habits that are exacerbating the problems of vocal communication.

Another risk expectancy is based on the assumption that depression is an anxiety related feature of type-D personality trait (21,25). Denollet described negative affectivity as the stable tendency to experience negative emotions across time and situations (16). It has been observed in association with emotional distress, including anxiety and depression, vital exhaustion and social alienation (16,25,27). The suspected risk is that a basic mood of depression that is combined with feelings of loneliness and social isolation (SCL-90), becomes a facilitator for increasingly conscious worrying about the voicing (VHI). Therefore, anticipatory anxiety about the disturbed voicing can easily become associated with non- effective coping with vocal communication in diverse communication situations that offer opportunities and demands for vocal communication (10,11). This is in agreement with the statements of Meulenbroek et al., i.e. that awareness of cognitive, social and vocal dysfunctions may correspond with increasing depression, and that might be considered as a plausible effect of intensified and enduring anxiety (15).

In conclusion, it can be stated that type-D female voice patients compared to their non- type-D

counterparts, report a relatively great biopsychosocial impact of their voice problem (voice handicap – predominantly the emotional impact) and relatively high psychosomatic illness. These results lead to the suspicion that the voice patients with type-D personality are especially at risk because they are prone to be involved in a circular negatively reinforcing process. This process influences the vocal problem in such a way that a detrimental course of vocal communication possibly occurs. Elements of this process have been described in clinical and experimental experience (10–12,28).

Declaration of interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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